

PARTIAL ATOMIC LAYER EPITAXIAL METHOD

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Abstract

PURPOSE: To permit growth of an epitaxial layer of a partial atomic layer by a method wherein atoms or molecules are partially adsorbed on the surface of a substrate so that a part of atoms or molecular-constituting atoms is coupled to the substrate surface.

CONSTITUTION: The surface of an Si substrate 1 containing P is cleaned through plasma in an Ar vacuum container, and chlorine gas is passed to form a Cl adsorption layer 2 on the surface of the substrate 1 at the room temperature. Then, the substrate 1 is heated up to about 100 deg.C, so that only P atoms are converted to PCl_3 and evaporated. By passing BBr_3 at the room temperature in that state, B forms an adsorption layer 3 together with Br in positions where P atoms have been removed from the surface of the substrate 1. Then, by passing hydrogen on the substrate 1 at the room temperature, Cl, Br, etc. are converted to HCl, HBr, etc. and removed, whereby P atoms are replaced by B atoms which are buried in position where P atoms have existed.